Teledermatology Consultations Provide Specialty Care for Farmworkers in Rural Clinics

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Abstract:

Context: Rural patients have limited access to dermatologic care. Farmworkers have high rates of skin disease and limited access to care.
Purpose: This exploratory study assessed whether teledermatology consultations could help meet the needs of health care providers for farmworkers in rural clinics.
Methods: Dermatologists provided 79 consultations, using store-and-forward teledermatology, to farmworkers who presented with a skin disease to rural North Carolina clinics. Clinic providers rated the value of the consultation.
Finding: Most requests for consultations (94%) came from family nurse practitioners or physician assistants. Twelve percent of consultations were rated somewhat helpful, and the remainder helpful or very helpful. After receiving the consultation, providers changed the diagnosis in 13% of cases. The consultation led providers to contact or attempt to contact 21% of patients to change treatment recommendations.
Conclusions: Access to expert dermatologic services is needed by rural health care providers. Teledermatology consultations may be a helpful tool to meet this need.

Article:

Skin diseases are common among farmworkers, who are routinely exposed to a number of potential irritants including plants, biological agents, and pesticides.[1-7] Most farmworkers live in rural communities and seek medical care from migrant or community clinics. Access to specialists, including dermatologists, is limited in rural clinics.[8,9] Most farmworkers are uninsured, and cost and work demands limit their use of specialty care. Therefore, providers in migrant and community clinics who treat farmworkers must manage skin conditions with limited ability to refer patients to dermatologists.

Telemedicine allows specialists in urban centers to consult with rural providers. This platform employs still or video photography along with telecommunication technologies to allow specialists to view patient information and consult with the treating provider. The store-and-forward teledermatology method involves sending still digital photographs and pertinent patient history information from a general practitioner to a dermatologist via the Internet and using electronic mail or telephone as a means of communication between the treating provider and the consultant.[10] A number of studies of the accuracy and effectiveness of store-and-forward teledermatology demonstrate that it is a viable option for increasing access to dermatology care.[9, 11-15] In urban studies, referring providers have high satisfaction rates with store-and-forward teledermatology and believe the consultations have an educational benefit.[13,16-19] Studies that assess rural general practitioners' satisfaction with store-and-forward teledermatology are needed, particularly in situations where patients cannot easily be referred for specialty care. For this study, store-and-forward teledermatology was used by health care providers in four migrant or community clinics in rural eastern North Carolina to share patient information and digital images of skin lesions with consulting dermatologists at an urban academic hospital.

The primary purpose of this analysis was to assess rural primary providers' evaluations of teledermatology consultations for treating farmworker patients. Data came from evaluation forms that primary care providers completed.

Methods

Recruitment of patients was conducted at 4 community and migrant clinics in eastern North Carolina. The clinics were Harvest Family Clinic from Carolina Family Health Centers, Inc., South Robeson Clinic and Julian T. Pierce Clinic from Robeson Health Care Corporation, and Walstonburg Clinic from Greene County Health Care, Inc. Inclusion criteria were: currently employed as hired laborer in farm work, legal adult, a patient at the clinic, and presenting at the clinic or to outreach provider with a primary or secondary diagnosis of a skin disease. The skin disease did not need to be the patient's primary complaint. The total sample included 79 farmworkers (53 males and 26 females).

The overall study was designed to document all skin diseases seen in clinics that treat farmworkers. Study protocol called for primary providers to submit all skin diseases that presented in the clinics for consultation, rather than only those for which they desired assistance, so the full range of skin diseases seen in the clinics could be documented. Data were collected using a patient information form, photographs of the affected area(s), a dermatologist consultation form, and an evaluation questionnaire. The photographs taken of the affected area(s) included one with the participant identification number, close-ups, and shots that included unaffected skin surrounding the lesion. The patient information form was completed by the primary provider. It described the symptoms of the skin disease; duration of symptoms; self-treatments; and the provider's diagnoses, treatments prescribed, and comments. The dermatologist consultation form included the dermatologist's diagnoses, treatment recommendations, and comments. After receiving the consultation form, primary providers completed the evaluation questionnaire concerning the helpfulness of the consultation. They rated the consultation as not helpful at all, somewhat helpful, helpful or very helpful. Primary providers also indicated whether, after reviewing the dermatologist consultation form, they changed the patient's diagnosis and if they contacted or attempted to contact the patient to change the treatment. No guarantee of anonymity was given to providers when they turned in evaluation forms.

Data were collected from June through October 2006 by clinic providers who were trained by the study's Project Coordinator to complete informed consent, interviews, and to take digital pictures of the affected skin. After recruiting a farmworker and obtaining consent, the clinic staff completed the questionnaire and patient information form and took the photos using a Nikon Coolpix 5400 camera. The interviewer uploaded the photos and patient information form onto a secure server and sent notification to dermatologists via electronic mail that new consultations were available for review. One of 2 board-certified dermatologists reviewed the photos and patient information form and then posted the consultation to the secure server. Most of the consultations were returned to providers within 24 hours. Providers reviewed the consultations and tried to contact participants if they felt changes to the diagnoses or treatments were necessary.

Participants received a cash incentive of $20. Data collection procedures were approved by the Wake Forest University School of Medicine Institutional Review Board.

Results

Multiple providers at each of the 4 clinic sites submitted consultation requests. Of these, 3 were medical doctors (MD), 1 was a physician assistant (PA), and 3 were family nurse practitioners (FNP). A total of 79 consult requests were submitted. Of these, 68 were submitted by FNPs, 6 by the PA, and 5 by MDs.

The consulting dermatologists diagnosed 33 different skin diseases in the 79 patients. Many of the diagnoses were of diseases that are regularly diagnosed in general practice such as acne, folliculitis, atopic dermatitis/ eczema, tinea pedis, tinea corporis, onychomycosis, warts, contact dermatitis, and psoriasis. A number of the diagnoses were ones that are less common in general practice including acanthosis nigricans, bullous impetigo, polymorphous light eruption, erythema multiforme, solar lentigenes, and cutaneous larva migrans.

Providers did not rate any of the consultations as "not helpful at all." Eleven percent of consultations were rated as somewhat helpful, 54% helpful, and 32% very helpful. Providers indicated that they had changed the diagnosis of the skin disease after reviewing the dermatologist consultation in 10 (13%) cases. Of the cases with a changed diagnosis, 7 were referred by FNPs, 2 by a physician, and 1 by a PA. After reviewing the consultation, providers attempted to contact a total of 17 (21%) patients to change prescribed treatments. The provider for 14 of the cases with changed treatments was an FNP; it was a physician for 2 of the cases, and a PA for 1 case. Providers were able to contact 12 (71%) of the patients they thought should change prescribed treatments; their attempts at contact were unsuccessful in 5 (29%) of the cases. The providers contacted or attempted to contact patients in all 10 of the cases in which the provider changed the diagnosis. The following cases illustrate diagnoses or treatments that were changed by the provider after receiving the consultations:

> ***Case 14:*** The primary provider originally diagnosed an 18-year-old Hispanic male farmworker with tinea corporis with atopic dermatitis included in the differential. The provider prescribed treatment consisting of washing the affected area with selenium sulfide shampoo. The dermatologist consultation diagnosed the patient with contact dermatitis and suggested treatment with triamcinolone ointment. The provider attempted to contact the patient to change the prescribed treatment, but was not able to locate him.
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> ***Case 72:*** The primary provider originally diagnosed a 53-year-old Hispanic male farmworker with contact dermatitis and prescribed hydrocortisone cream 2.5%. The dermatologist agreed with the contact dermatitis diagnosis and recommended using 0.05% flucocinonide cream instead of hydrocortisone because a stronger anti-inflammatory was needed. The provider attempted but was not able to contact the patient to change the prescription.

Discussion

Although skin diseases are common, their diagnosis and management are often perplexing. The skin is the interface with the environment and may exhibit a myriad of different changes in response to internal and external forces. Varying degrees of redness, scale, and crust may be present across common disorders such as allergic contact dermatitis, tinea, impetigo, irritant dermatitis, and psoriasis. Patients with skin disease frequently present to primary care providers, the majority of whom have received limited formal dermatology training and diagnose common dermatoses accurately approximately half as often as do dermatologists. [18,20,21]

In this study, 4 of 7 providers (57%) were midlevel providers. However, they accounted for 94% of requests for consultation. This suggests that FNPs and PAs see most of the patients in these clinics. A previous evaluation of the quality of dermatologic care delivered by PAs found that those practicing outside a dermatologist's office had significantly poorer prescribing behavior.[22] Providing a teledermatology consult may improve the quality of care they provide.

Patients with skin disease commonly present to rural health care providers. Access to in-person dermatologic consultations may be very limited in this setting. In this study, the providers rated teledermatology consultation as helpful or very helpful in 86% of cases. This may indicate that, in a majority of cases, the provider had some doubt about the diagnosis or treatment. In 13% of cases the diagnosis was changed, and in 21% there was a change in the planned treatment. This indicates that there is room for improvement in the delivery of health care services for patients with skin disease in the rural health care setting.

Meeting the dermatologic needs of this rural, largely uninsured population will be difficult .[23] There is a history of uneven distribution of dermatologists in the United States and elsewhere, with rural areas tending to have a shortage.[24] Studies also suggest an overall shortage of dermatologists in the United States .[25,26] Teledermatology was used in this study as a way to allow dermatologists in an urban setting to determine the specific skin disease diagnoses experienced by farmworkers who present at rural migrant health clinics. Teledermatology could be one means to deliver dermatologic services to this population. However, if there is a shortage of dermatologists, providing teledermatology services may not be an appropriate solution. Teledermatology would add to the

demand for dermatologists' services without adding any supply. If poor distribution is the primary problem, then teledermatology may be more helpful.

In this study, clinic providers were asked to send patient information and a consultation form to the dermatologists for all farmworker patients who presented with a skin disease regardless of whether or not the skin disease was the reason for the visit. A number of the skin diseases for which consultations were provided were those that providers who treat farmworkers see on a regular basis, such as fungal infections and contact dermatitis. It is likely that providers felt relatively confident in their diagnoses and treatment recommendations for many of the patients. They likely would not have requested a consultation had the research protocol not required that all skin diagnoses be submitted for the consultation.

Despite this, the providers perceived the majority of these consultations as helpful. It is possible that access to teledermatology consultations would help increase clinic providers' skill and confidence. We expect that the benefit gained from consultations will not be limited to the individual patient for whom the consultation was made. The providers may use what was learned from such consultations to help them more accurately diagnose and treat future cases, resulting in decreased demand for consultation over time. However, it would also likely result in better care for patients such as farmworkers who are difficult to relocate for additional diagnostic tests or treatment changes.

Several aspects of the study limit the generalizability of these results. It is possible that the providers gave more favorable ratings of the value of the consultations than they would have had their evaluations been anonymous. This study was not designed to test the accuracy of teledermatology. Therefore, we cannot confirm that the diagnoses made by the dermatologists were the same as they would have been in a face to face visit. Moreover, we cannot assess whether the perceived value of the teledermatology consultations is as great as the perceived value of in-person dermatologic consultations. The instrument used to assess the value of the consultations to the health care provider was not validated. Despite these limitations, these results indicate that health care providers in rural clinics perceive teledermatology consultations as a useful resource.

We suggest that a system through which rural health care providers could receive teledermatology consultations on an as-needed basis would prove to be a valuable resource and would help improve dermatology care available in rural primary care clinics. One lesson learned from this study is that store-and-forward teledermatology will be more useful to providers if they are able to receive the consultation while the patient is still in the clinic. Once farmworkers leave the clinic, it can be very difficult to follow up to change treatment regimens. To achieve this rapid response, it may be necessary to establish a system in which clinic providers contact a designated person who has a list of dermatologists available at any given time and relays consultation requests to the dermatologist who can respond most quickly. Teledermatology has the potential to be a valuable tool for improving the dermatological care available to farmworkers.

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